UNITED STATES PATENT AND TRADEMARK OFFICE

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EXAMINER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2009*.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12-23* is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *12-23* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *11 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claim 18 is objected to because of the following informalities: period is missing at

the end of claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3.   Claims 12-15, and 18-20 are rejected under 35 U.S.C. 102(b) as being

anticipated by Garcia-Luna-Aceves et al. (Pub No. US 2002/0141346 A1, hereinafter

Garcia-Luna-Aceves).

        For **claim 12**, Garcia-Luna-Aceves teaches a method (see Title) for determining

paths in a communication network having links (Fig. 8 shows a network with links) for an

optimized shortest-path routing (*computing the shortest path*, see [0084], lines 5-6)

relative to the network loading and having a traffic volume expected for the

communication network (*traffic bursts,* see [0082], lines 5-6; *flows,* see [0084], line 3)

comprising:

        initializing a link cost for each of the links (*Initialize all tables,* see Fig. 1, line 4;

and *The link tables stores ... the cost,* see [0113], lines 1-2. Also see [0115], lines 1-5);

        calculating optimum paths for the routing in the communication network relative

to the link costs (notice that at the initialization when power is applied, cost increases

from 0 to some value that is a change; *link-cost changes … routing paths must be recomputed*, see [0162], lines 3-5. The paths recomputed are optimum paths, see [0004], lines 2-3 for explanation);

determining a parameter (*Eq. (15) … determines the routing parameters,* see [0084], lines 10-11) for each of the links (*of the links,* see [0084], line 12. Notice that the variable k in Eq. (15) is related to each link, see [0012]) based on the link traffic load of the communication network for routing the expected traffic volume through the calculated optimum paths (a function ψ to allocate flows over those paths *… in Eq. (15),* see [0084], lines 3-10. The "flows" are claimed traffic load);

changing the link costs based on the determined parameters (Eq. (34) shows changing marginal delay which is link cost –see [0167], lines 1-2 for explanation– based on flows which are measured by parameters described above) such that a link cost of a first link is increased relative to a link cost of a second link when a determined parameter of the first link is greater than a determined parameter of the second link (*the path vl →j … is greater than the cost v →j,* see [0132], lines 2-3, and Eq. (34). Notice that [0132] and [0167] are in the same endeavor);

re-determining the parameters for the routing of the expected traffic volume (link cost changes … *routing paths must be recomputed,* see [0162], lines 3-5) via the subset of paths of the calculated paths that are optimized with respect to the changed link costs (the recomputed paths are claimed subset of paths of the calculated paths because they are part of the total calculated paths);

repeating the changing and the re-determining steps until achieving a termination

criterion (*the whole process is repeated*, see [0115], last 2 lines; *achievement of near-*

optimal routing, see [0186], lines 2-3; and *A practical framework and "near-optimal"*

routing method which approximates minimum delay routing within a network, see

Abstract, lines 1-2. The "*near-optimal*" is with the meaning of "*practical*", therefore it is

actually optimal as all other applications and patents describe. Notice that [0115] and

[0186] are in the same endeavor); and

using the subset of paths in a last step of re-determining for the routing in the

communication network (*achievement of near-optimal routing*, see [0186], lines 2-3).

As to **claim 13**, Garcia-Luna-Aceves teaches the method in accordance with

claim 12, wherein all paths for the routing in the communication network that are

optimum relative to the initial values for the link costs are calculated (*Initialized to null …*

empty set, see [0115], lines 1-5. It can be seen that optimum value for routing is

needed).

As to **claim 14**, Garcia-Luna-Aceves teaches the method in accordance with

claim 12, wherein the parameter for each link is based on item selected from the group

consisting of an absolute traffic load, a traffic load relative to the link bandwidth, traffic-

related costs occurring during the use of the link, an availability of the link, a run time of

the link, and a load capacity of final nodes of the link (*loads*, see [0081], line 5, and

[0184], lines 13-14. Notice that the parameter for each link is based on item selected

from the group, so only one item is needed for the rejection).

As to **claim 15**, Garcia-Luna-Aceves teaches the method in accordance with claim 12, wherein the links are initialized to the same link cost (*Initialize all tables*, see Fig. 1, line 4. The initialized value was a matter of "design choice", and can be set to any value. The limitation does not carry any patentable weight).

As to **claim 18**, Garcia-Luna-Aceves teaches the method in accordance with claim 12, wherein a maximum of the parameters is determined during the re-determining step (*minimizing delays or maximizing throughput*, see [0005], lines 8-9; and *achievement of near-optimal routing*, see [0186], lines 2-3. Notice that delays are directly related to cost as described above, and [0115] and [0186] are in the same endeavor); and

wherein the termination criterion is achieved when the maximum of the parameters is greater than the maximum of the parameters during the preceding changing and re-determining steps (*the whole process is repeated*, see [0115], last 2 lines; and *achievement of near-optimal routing*, see [0186], lines 2-3. The "*process is repeated*" means finding the maximum of the parameters greater than the maximum of the parameters during the preceding changing).

As to **claim 19**, Garcia-Luna-Aceves teaches the method in accordance with claim 18, wherein the subset of paths for the preceding changing and re-determining steps is used for routing in the communication network (*achievement of near-optimal routing*, see [0186], lines 2-3. The recomputed paths are claimed subset of paths of the calculated paths because they are part of the total calculated paths).

As to **claim 20**, Garcia-Luna-Aceves teaches the method in accordance with

claim 12, wherein a maximum of the parameters is determined during the re-

determining step (*minimizing delays or maximizing throughput*, see [0005], lines 8-9; *the*

whole process is repeated, see [0115], last 2 lines; and *achievement of near-optimal*

routing, see [0186], lines 2-3. Notice that [0115] and [0186] are in the same endeavor);

and

wherein the termination criterion is achieved:

when the maximum of the parameters is greater than the maximum of the

parameters during the preceding changing and re-determining steps (*the whole process*

is repeated, see [0115], last 2 lines; and *achievement of near-optimal routing*, see

[0186], lines 2-3. The *"process is repeated"* means finding the maximum of the

parameters greater than the maximum of the parameters during the preceding

changing), and

when a determination is made that during the preceding changing and re-

determining steps the subset of paths contains no alternative paths (*achievement of*

near-optimal routing, see [0186], lines 2-3. The recomputed paths are claimed subset of

paths of the calculated paths because they are part of the total calculated paths, and

the *"optimal routing"* means no alternative paths).

Claim Rejections - 35 USC § 103

4.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves, in view of Barri et al. (Pub No. US 2003/0081608 A1, hereinafter Barri).

As to **claim 16**, Garcia-Luna-Aceves teaches everything claimed as applied above (see 12). However, Garcia-Luna-Aceves fails to specifically teach wherein the paths are calculated via an equal cost multipath.

Barri teaches paths are calculated via an equal cost multipath (ECMP) method (ECMP, see [0005]).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Garcia-Luna-Aceves with Barri to obtain the invention as specified, to support an equal cost multipath algorithm (ECMP) for traffic load (see Barri, [0005]).

6.   Claims 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Garcia-Luna-Aceves, in view of Nucci et al. (U.S. Patent 7395351 B1, hereinafter Nucci).

As to **claims 21 and 23**, Garcia-Luna-Aceves teaches everything claimed as applied above (see 12). However, Garcia-Luna-Aceves fails to specifically teach further comprising changing a traffic matrix via random values in relation to entries in a random matrix, so that the subset of paths contains no alternative paths, wherein the expected traffic volume is based on the traffic matrix.

Nucci teaches further comprising changing a traffic matrix via random values in relation to entries in a random matrix, so that the subset of paths contains no alternative

paths (*utilizes ... the traffic matrix to evaluate the initial solution ... random number in the range*, see col. 8, lines 8-17; and *by routing all traffic along the minimum cost shortest paths*, see col. 3, line 23. The "*minimum cost shortest paths*" means that the subset of paths contains no alternative paths. The computed shortest paths are claimed subset of paths because they are part of the total paths),

wherein the expected traffic volume is based on the traffic matrix (*this evaluation will consist of placing all traffic demands across the minimum cost shortest paths*, see col. 8, lines 8-11. The "*all traffic demands*" are the expected traffic volume).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine Garcia-Luna-Aceves with Nucci to obtain the invention as specified, to use mode detailed traffic information to determine the best path.

As to **claim 22**, it is the same as claim 19 except depending on claim 21, therefore it is rejected for the same reason above.

Allowable Subject Matter

7.   Claim 17 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to WANDA Z. RUSSELL whose telephone number is

(571)270-1796. The examiner can normally be reached on Monday-Thursday 9:00-6:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on (571) 272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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